Resources: YouTube videos and the JELCKC website and archive

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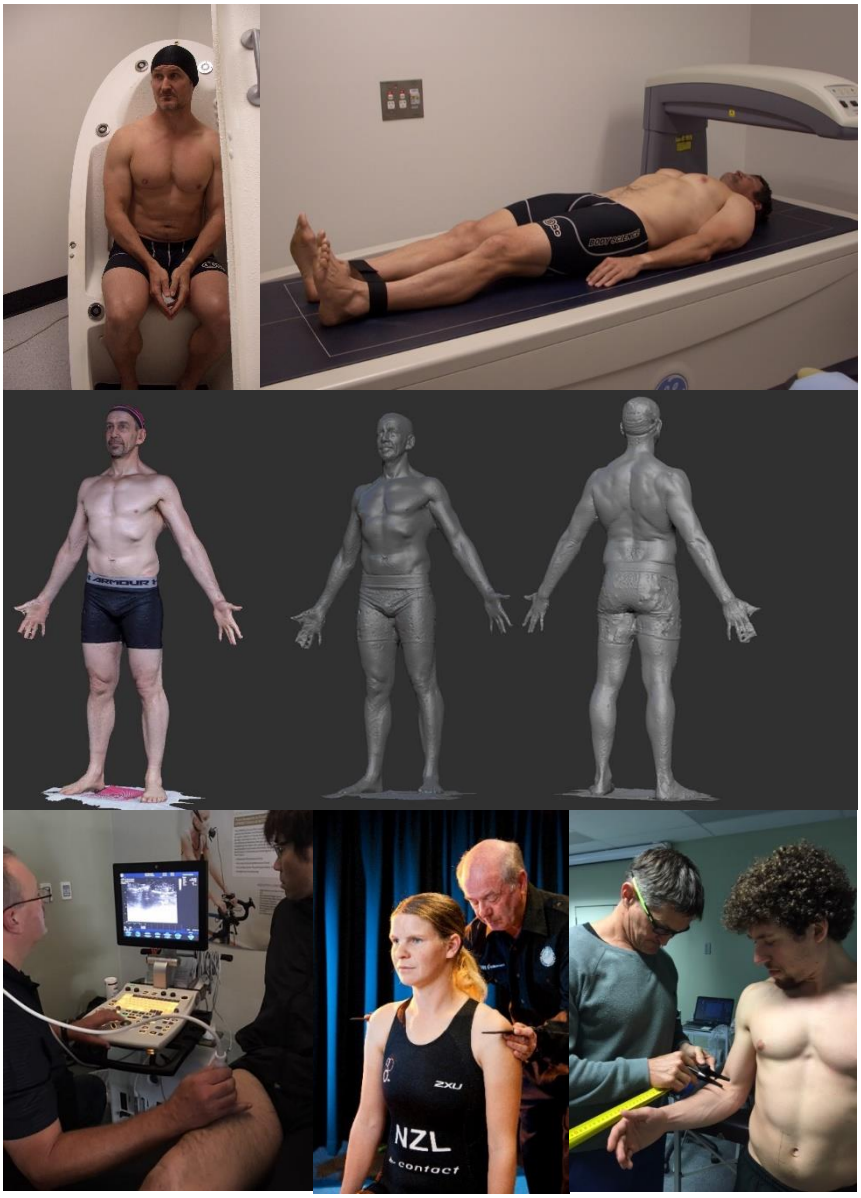

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Chapter 20 - Resources: YouTube Videos And The JELCKC Website And Archive

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Abstract

Additional resources to support the content in *Best Practice Protocols For Physique Assessment In Sport* are available at the J.E. Lindsay Carter Kinanthropometry Clinic and Archive (JELCKCA) website jelckca-bodycomp.com, which links you to the YouTube channel http://tinyurl.com/YouTubeChannel-ProfPatria. YouTube videos include introduction of experts and their background in physique assessment, demonstration of physique assessment procedures, and commentary from experts on issues related to physique assessment. The physical kinanthropometry archive is located at the Auckland University of Technology Millennium precinct in Auckland, New Zealand.

YouTube videos

It is often easier to appreciate and learn a technique when you can see an expert using the technique and providing explanations on key points. We have provided videos of several of our experts demonstrating the techniques and also commenting on issues related to the techniques. YouTube videos include introduction of experts and their background in physique assessment, demonstration of physique assessment procedures, and commentary from experts on issues related to physique assessment. Find the information via the link at jelckca-bodycomp.com or go to http://tinyurl.com/YouTubeChannel-ProfPatria.

Identify the videos in the series with the logo 

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Physique Assessment Experts

Fig. 20.1. shows the YouTube physique assessment experts who share some of their background in physique assessment in the YouTube videos. Table 20.1 provides the links for the experts YouTube videos.

Fig. 20.1. YouTube physique assessment experts start screen

Table 20.1. Links for the physique assessment experts YouTube videos.

Physique assessment expert	YouTube link
Professor Patria **Hume** PhD, MSc(Hons), BSc, ISAK4, DipCoachNZG, FISBS (Auckland University of Technology)	http://tinyurl.com/PA-Expert-Patria-Hume
Associate Professor Deborah **Kerr** PhD, MSc, GradDipDiet, BAppSc, APD, ISAK4 (Curtin University)	https://tinyurl.com/PA-Expert-Deborah-Kerr
Professor Tim **Ackland** PhD, FASMF, FRSB (University of Western Australia)	https://tinyurl.com/PA-Expert-Tim-Ackland
Associate Professor Jacqueline **Alderson,** PhD, FISBS (University of Western Australia)	https://tinyurl.com/PA-Expert-Jacqueline-Alderson
Professor J. Hans **de Ridder** PhD, ISAK4 (North-West University)	https://tinyurl.com/PA-Expert-Hans-De-Ridder
Dr Kagan **Ducker** PhD, BSc(Hons), ESSAM, AES, ASpS2, ISAK3 (Curtin University)	https://tinyurl.com/PA-Expert-Kagan-Ducker
Dr Stephen **Hollings** PhD, DipEd, DipSpEd, AdvDipTchg, ISAK3 (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Stephen-Hollings
Associate Professor Masaharu **Kagawa** PhD, BSc(Hons), RPHNutr, ISAK3 (Kagawa Nutrition University)	https://tinyurl.com/PA-Expert-Masaharu-Kagawa
Associate Professor Justin **Keogh** PhD, BHMS(Hons), BHSc (Ex & Sp Sci), FAAG, FISBS (Bond University)	https://tinyurl.com/PA-Expert-Justin-Keogh

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Ms Ava **Kerr** BSc., MSc, AES, CSCS, ISAK3 (University of the Sunshine Coast)	https://tinyurl.com/PA-Expert-Ava-Kerr
Mr Stephven **Kolose** MSc, PGDipErg, BSc, ISAK2 (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Stephven-Kolose
Dr Anna **Lorimer** PhD, BSc (Hons), ISAK3 (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Anna-Lorimer
Associate Professor Duncan **Macfarlane** DPhil Oxon, BSc(Hons), BPhEd, FACSM, ISAK3 (The University of Hong Kong)	https://tinyurl.com/PA-Expert-Duncan-Macfarlane
Dr Kristen **MacKenzie-Shalders** PhD, APD, Adv Sports Dietitian, Acc. Sports Scientist, ISAK3 (Bond University)	https://tinyurl.com/PA-Expert-Kristen-MacKenzie-Sh
Dr Lisa **McDonnell** PhD, MSc, BSc (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Lisa-McDonnell
Professor Wolfram **Müller** PhD, Mag.rer.nat. (Medical University of Graz)	https://tinyurl.com/PA-Expert-Wolfram-Muller
Dr Alisa **Nana** PhD, APD, ASD (Mahidol University)	https://tinyurl.com/PA-Expert-Alisa-Nana
Mr Clinton **Njoku** MSc(Hons), BSc (Ebonyi State University, Abakaliki)	https://tinyurl.com/PA-Expert-Clinton-Njoku
Associate Professor Helen **O'Connor** PhD, DipND, BSc., ISAK3, APD, Adv. SD (University of Sydney)	https://tinyurl.com/PA-Expert-Helen-OConnor
Professor Elaine **Rush** MNZM, PhD, MSc(Hons), Registered Nutritionist, FCT, (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Elaine-Rush
Mr Greg **Shaw** BHSc(Nutr& Diet), IOC Diploma in Sports Nutrition, ISAK3 (Australian Institute of Sport)	https://tinyurl.com/PA-Expert-Greg-Shaw
Mr Kelly **Sheerin** MHSc(Hons), BHSc, BSc, ISAK3 (Auckland University of Technology)	https://tinyurl.com/PA-Expert-Kelly-Sheerin
Associate Professor Gary **Slater** PhD, MSc., BSc., APD, Adv ASD, ISAK3 (University of the Sunshine Coast)	https://tinyurl.com/PA-Expert-Gary-Slater
Dr Arthur **Stewart** PhD, ISAK4 (Robert Gordon University)	https://tinyurl.com/PA-Expert-Arthur-Stewart

Physique Assessment Technique Demonstrations

Fig. 20.2. shows the YouTube physique assessment technique demonstrations start screen that appears for the videos of the experts demonstrating physique assessment procedures videos. Table 20.2 provides the links for the physique assessment experts' technique demonstration YouTube videos.

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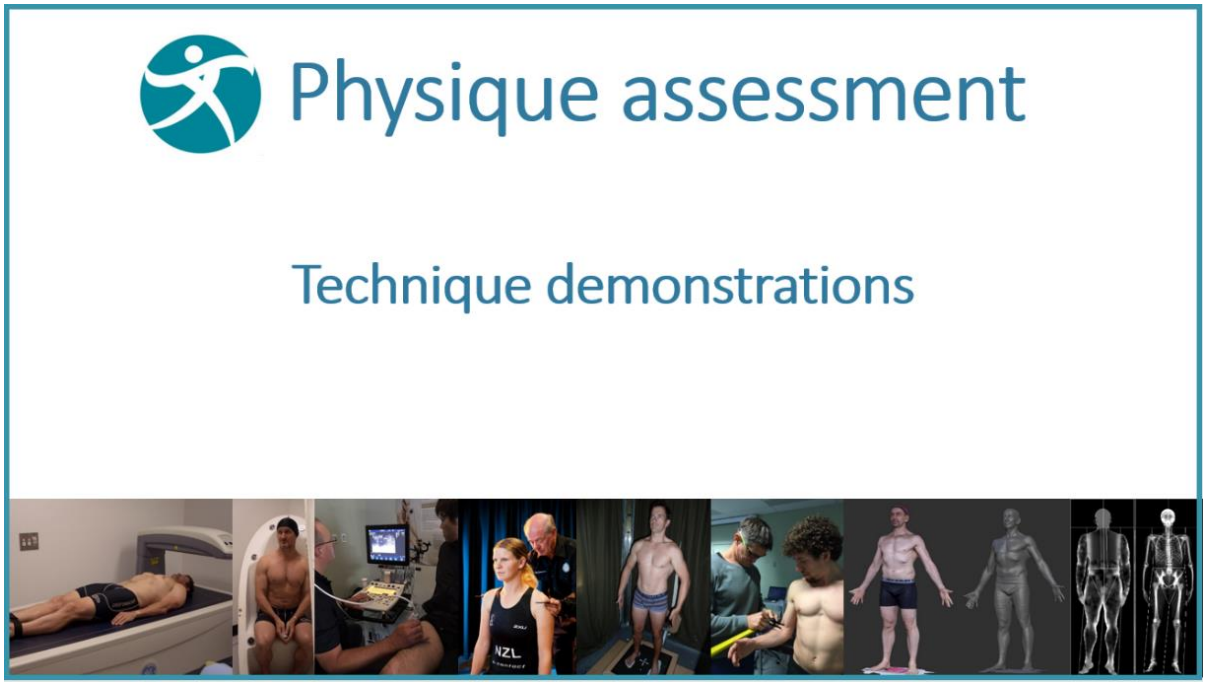

Fig. 20.2. YouTube physique assessment technique demonstration start screen

Table 20.2. Links for the physique assessment experts' technique demonstration YouTube videos.

Bod Pod demonstration	
Associate Professor Gary Slater demonstrates: Bod Pod body composition assessment.	https://tinyurl.com/PA-Demo-GS-Bod-Pod
Dual energy X-ray absorptiometry (DXA) demonstrations	
Associate Professor Gary Slater demonstrates: DXA body composition assessment.	https://tinyurl.com/PA-Demo-GS-DXA
Professor Tim Ackland demonstrates: DXA body composition assessment.	https://tinyurl.com/PA-Demo-TA-DXA
Ultrasound demonstration	
Professor Tim Ackland demonstrates: Ultrasound body composition assessment.	https://tinyurl.com/PA-Demo-TA-Ultrasound
Bioelectrical impedance analysis (BIA) demonstration	
Dr Kagan Ducker demonstrates BIA measurement	https://tinyurl.com/PA-Demo-KD-BIA
Surface anthropometry (ISAK) demonstrations	
Landmarking	
Associate Professor Gary Slater demonstrates: Acromiale land marking.	https://tinyurl.com/PA-Demo-GS-Acromiale-landmark
Associate Professor Gary Slater demonstrates: Radiale land marking.	https://tinyurl.com/PA-Demo-GS-Radiale-landmark
Associate Professor Gary Slater demonstrates: Mid-acromiale land marking.	https://tinyurl.com/PA-Demo-GS-MidAcromRad-landmark
Skinfolds	

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Associate Professor Gary Slater demonstrates: Sub scapula skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Subscapula-Skinfold
Associate Professor Gary Slater demonstrates: Biceps skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Biceps-Skinfold
Associate Professor Gary Slater demonstrates: Triceps skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Triceps-Skinfold
Associate Professor Gary Slater demonstrates: Iliac crest skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Iliaccrest-Skinfold
Associate Professor Gary Slater demonstrates: Supraspinale skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Supraspinale-Skinfold
Associate Professor Gary Slater demonstrates: Abdominal skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Abdominal-Skinfold
Associate Professor Gary Slater demonstrates: Front thigh skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Front-thigh-Skinfold
Associate Professor Gary Slater demonstrates: Calf skinfold marking and measurement.	https://tinyurl.com/PA-Demo-GS-Calf-Skinfold
Associate Professor Gary Slater demonstrates: All skinfold measurements.	https://tinyurl.com/PA-Demo-GS-All-Skinfolds
Associate Professor Gary Slater explains: skinfold measurement process	https://tinyurl.com/PA-Demo-GS-Skinfold-process
Associate Professor Masahura Kagawa demonstrates: Calf skinfold measurement.	https://tinyurl.com/PA-Demo-MK-Calf-Skinfold
Associate Professor Masahura Kagawa demonstrates: Japanese skinfold caliper jaw calibration.	https://tinyurl.com/PA-Demo-MK-Caliper-calibrate
Girths	
Our physique assessment experts Associate Professors Deborah Kerr and Masahura Kagawa demonstrate: Calf girth measurement.	https://tinyurl.com/PA-Demo-DKMK-Calf girth
Associate Professor Masahura Kagawa demonstrates: Head girth measurement.	https://tinyurl.com/PA-Demo-MK-Head-girth
Associate Professor Masahura Kagawa demonstrates: Japanese tape for girth measurements.	https://tinyurl.com/PA-Demo-MK-Japan-girth-tape
Breadths	
Our physique assessment experts Associate Professors Deborah Kerr and Masahura Kagawa demonstrate: Humerus bone breadth measurement.	https://tinyurl.com/PA-Demo-DKMK-Humerus
Our physique assessment expert Associate Professor Masahura Kagawa demonstrates: Femur bone breadth measurement.	https://tinyurl.com/PA-Demo-MK-Femur
Our physique assessment experts Associate Professors Deborah Kerr and Masahura Kagawa demonstrate: Bi-acromiale bone breadth measurement.	https://tinyurl.com/PA-Demo-DKMK-Biacromiale
Lengths	
Associate Professor Masahura Kagawa demonstrates: Foot length measurement.	https://tinyurl.com/PA-Demo-MK-Foot-length

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Associate Professor Masahura Kagawa demonstrates: Tibiale-laterale length measurement.	https://tinyurl.com/PA-Demo-MK-Tibiale-laterale
Basics	
Associate Professor Masahura Kagawa demonstrates: Standing height measurement.	https://tinyurl.com/PA-Demo-MK-Standing-height
Associate Professor Masahura Kagawa demonstrates: Sitting height measurement.	https://tinyurl.com/PA-Demo-MK-Sitting-height

Experts Commentary On Issues Related To Physique Assessment

Professor Patria Hume posed questions to experts. Fig. 20.3. shows the YouTube physique assessment expert commentary start screen that appears for the videos of some of the experts providing commentary on questions commonly asked regarding physique assessment. Table 20.3 provides the links for the physique assessment experts' commentary on issues related to physique assessment YouTube videos.

Fig. 20.3. YouTube Physique Assessment technique expert commentary start screen

Table 20.3. Links for the physique assessment experts' physique assessment experts' commentary on issues related to physique assessment YouTube videos.

Chapter and questions	YouTube link
Why is the Physique Assessment book useful?	https://tinyurl.com/PA-Q-DK-Book-useful-why
Part I. Why Measure Physique?	
Why would a health care practitioner consider monitoring the body composition of a client?	https://tinyurl.com/PA-Q-expert-Why-monitor-body
What benefits would an individual gain from having their physique assessed?	https://tinyurl.com/PA-Q-Benefit-physique-assess
When do you use anthropometry?	https://tinyurl.com/PA-Q-expert-When-anthropometry
Chapter 1 - Physique Assessment In Youth Sports For Talent Identification And Development	

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Why do you measure body size and shape for talent identification and development?	https://tinyurl.com/PA-Q-expert-Body-size
Chapter 2 - Anthropometry And Health For Sport	
Does body composition influence health?	https://tinyurl.com/PA-Q-expert-Bodycomp-Health
How do you use growth charts and normative data sets?	https://tinyurl.com/PA-Q-expert-Growth-chart
What variables are you interested in for determining appropriate growth?	https://tinyurl.com/PA-Q-expert-Growth-vars
How do you use physique assessment to understand growth changes?	https://tinyurl.com/PA-Q-expert-Growth-changes
What variables are you interested in for determining malnourishment?	https://tinyurl.com/PA-Q-expert-Malnourishment
What variables are you interested in for determining obesity and related health problems?	https://tinyurl.com/PA-Q-expert-Obesity-vars
Chapter 3 - Optimising Physique For Sports Performance	
How do you work with coaches to plan athlete assessment?	http://tinyurl.com/PA-Q-expert-Coach-work
What are your clinical considerations in assessment of nutrition status of athletes?	https://tinyurl.com/PA-Q-expert-Clinical-consider
Does where you store body fat provide insight into the type of diet you should follow?	https://tinyurl.com/PA-Q-expert-Store-body-fat
What do you consider an ideal body fat level for an athlete?	https://tinyurl.com/PA-Q-GS-Body-fat-ideal
Chapter 4 - Physique Assessment For Sports Equipment Design, Fit And Performance Optimisation	
How is physique assessment important for ergonomics in sports?	https://tinyurl.com/PA-Q-expert-Paralympic
Part II. How To Use The Selected Method And Report The Data	
What is the best method for assessing body composition?	https://tinyurl.com/PA-Q-expert-Best-method
Is there a gold standard method of assessing body composition?	https://tinyurl.com/PA-Q-expert-Gold-std
Why do you assess body size, shape and composition for athletes?	https://tinyurl.com/PA-Q-expert-Why-assess-body-sz
What are your key tips for body composition assessment for athletes?	https://tinyurl.com/PA-Q-expert-Key-tips-bodycomp
As a health care practitioner, should I consider purchasing equipment to monitor the body composition of my clients? If so, what should I use?	http://tinyurl.com/PA-Q-expert-Equipment-purchase
Chapter 5 - Athlete Considerations For Physique Measurement	
Does what I do prior to a scan influence results?	http://tinyurl.com/PA-Q-expert-Prior-scan
Chapter 6 - Non-imaging Method: Surface Anthropometry	
In the modern age of body scanning, does surface anthropometry still have a role to play?	https://tinyurl.com/PA-Q-expert-Surface-anthro-role
Is surface anthropometry still worthwhile given all the new technology available?	https://tinyurl.com/PA-Q-expert-Anthro-worth
Is surface anthropometry actually accurate?	https://tinyurl.com/PA-Q-expert-Anthro-accurate
I measured myself on some scales and they told me I had 9% body fat. Will your results be able to compare to these?	https://tinyurl.com/PA-Q-expert-Fat-scales
Chapter 7 – Non-Imaging Method: 3D Scanning	

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What is 3D scanning useful for?	http://tinyurl.com/PA-Q-expert-3D-body-scanning
Chapter 8 - Non-Imaging Method: Air Displacement Plethysmography (Bod Pod)	
What is air displacement plethysmography or Bod Pod useful for?	https://tinyurl.com/PA-Q-expert-Bod-Pod-use
Chapter 9 - Non-Imaging Method: Bioelectrical Impedance Analysis (BIA)	
What is bioelectrical impedance useful for?	https://tinyurl.com/PA-Q-expert-BIA
Chapter 10 - Non-Imaging Method: Doubly Labelled Water	
Why is the doubly-labelled water technique not commonly used for athletes?	https://tinyurl.com/PA-Q-expert-Double-label-water
Chapter 11 - Imaging Method: Ultrasound	
What is ultrasound useful for?	https://tinyurl.com/PA-Q-expert-Ultrasound
Chapter 12 - Imaging Method: Computed Tomography (CT) and Magnetic Resonance Imaging (MRI)	
What is magnetic resonance imaging useful for?	https://tinyurl.com/PA-Q-expert-MRI-use
Chapter 13 - Imaging Method: Dual-Energy X-Ray Absorptiometry (DXA)	
What is dual energy X-ray absorptiometry useful for?	https://tinyurl.com/PA-Q-expert-DXA
How do you assess skeletal size, shape and bone mineral density?	https://tinyurl.com/PA-Q-expert-Skeletal-size
How do you assess muscle tissue changes?	https://tinyurl.com/PA-Q-expert-Msucle-change
What is the effect of client presentation on DXA assessment?	https://tinyurl.com/PA-Q-GS-DXA-client-present
Chapter 14 - Imaging Method: Technological And Computing Innovations	
What is new for imaging physique given technology developments?	https://tinyurl.com/PA-Q-expert-Tech-developments
Part III. Application Of Physique Assessment In Athletes	
Chapter 15 - Physique Assessment In Practice	
Do you have an example of when and how you measure physique of athletes?	http://tinyurl.com/PA-Q-expert-Example-athlete
How often should body composition be assessed?	https://tinyurl.com/PA-Q-expert-How-often
Why do you use multi-component models of body composition?	https://tinyurl.com/PA-Q-expert-Multi-models
What variables are you interested in when tracking clients longitudinally?	http://tinyurl.com/PA-Q-expert-Track-variables
Is it important to include other data when interpreting body composition data for athletes?	https://tinyurl.com/PA-Q-DK-Interpret-data
Can body composition variables be compared in cross-ethnic settings without problems?	https://tinyurl.com/PA-Q-expert-Ethnic-diffs
Are there any issues with anthropometry measurement protocols and data in Japan?	https://tinyurl.com/PA-Q-expert-Japan-prot-issue
What are examples of different protocols available in Japan, and how are they different to each other?	https://tinyurl.com/PA-Q-expert-Japan-prot-diffs
Chapter 16 - Recommendations For Conducting Research On Athletes	
How do you report results back to clients?	http://tinyurl.com/PA-Q-expert-Report-result
What large scale anthropometry projects have you been involved in?	https://tinyurl.com/PA-Q-DK-What-large-projects

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Chapter 17 - Physique Characteristics Associated With Athlete Performance	
What types of physique characteristics are related to the expression of muscular strength?	https://tinyurl.com/PA-Q-expert-Muscle-Strength
Chapter 18 - Body Image For Athletes	
Does body composition assessment create unnecessary anxiety for clients?	http://tinyurl.com/PA-Q-expert-Anxiety-physique
What variables are you interested in for examining body image in your study group?	https://tinyurl.com/PA-Q-expert-Body-image-vars
What is the SomatoMac app used for?	https://tinyurl.com/PA-Q-expert-Somatomac
Why is physique assessment important for aesthetic sports?	https://tinyurl.com/PA-Q-GS-Aesthetic-sport
Chapter 19 - Training And Accreditation Systems And Ethical Considerations	
Why are standardized protocols and valid and reliable measures needed for assessment?	http://tinyurl.com/PA-Q-expert-Valid-std
Why is precision in body composition measurement techniques important?	https://tinyurl.com/PA-Q-expert-Precision
Does it matter if I am assessed by different people on different equipment?	https://tinyurl.com/PA-Q-expert-Diff-people
Where do I go to get my body composition assessed?	https://tinyurl.com/PA-Q-expert-Where-assessed
How do you gain consent to conduct measurements of athletes?	http://tinyurl.com/PA-Q-expert-Consent
How do you maintain confidentiality when assessing body composition, especially in a team sport environment?	https://tinyurl.com/PA-Q-expert-Confidentiality
How do you store athlete information?	https://tinyurl.com/PA-Q-expert-Store-information
If I have concerns about body composition assessment, where do I go for information?	http://tinyurl.com/PA-Q-expert-Concerns
Why is certification for physique assessment important?	https://tinyurl.com/PA-Q-KD-Why-certification

A selection of quotes from some of the questions posed are provided in this chapter so readers can appreciate the nature of the content available in the videos related to the book chapters.

Part I. Why Measure Physique?

Why would a health care practitioner consider monitoring the body composition of a client?

- "The monitoring of physique traits affords a practitioner the opportunity to further personalise their interventions (training and/ or diet) for clients based on adaptations. Personally, I think it is unprofessional if you are not monitoring adaptations of clients when working with them to manipulate body composition. How else can you know if your intervention/s are having a favourable impact?" Associate Professor Gary Slater
- "For a variety of reasons. Many factors relating to your body composition are related to health outcomes (e.g. bone density and osteoporosis, visceral fat and risk of CV disease etc.). If you then choose to change these to positively affect risk factors, you need to be able to monitor body composition to see how things are changing." Dr Kagan Ducker
- "It is because body composition variables such as fat mass and fat-free mass are known to be associated with a number of health risks, physical performance and appropriate growth and development. Associate Professor Masaharu Kagawa

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What benefits would an individual gain from having their physique assessed?

- "Aside from facilitating further personalisation of interventions based on how the client responds, physique assessment provides invaluable motivation for clients, confirming the lifestyle (or other) changes they have made are resulting in favourable adaptations." Associate Professor Gary Slater
- "By their physique and body composition being assessed, individuals have better understanding of their current body size, proportion and adiposity or muscularity that is allows them to increase awareness of themselves and provide an opportunity to look at their lifestyle as a whole. Associate Professor Masaharu Kagawa

When do you use anthropometry?

- "I use anthropometry before and after specific periods of training to assess any changes. I also monitor skinfold measurements periodically throughout extensive periods of training to assess whether the changes, if any, are the direct result of the type of middle-distance training that has been undertaken" Dr Stephen Hollings
- "I have used anthropometry on a number of occasions to compare groups of a diverse range of ethnic and cultural backgrounds, including for health screening, assessment of health risks, monitoring young athletes, and a tool to assess one's body image." Associate Professor Masaharu Kagawa
- "I have used anthropometry throughout my career as a sports performance focused dietitian. I completed my Level 1 course some 20 years ago and there's not a week goes by where I'm not using anthropometry to monitor clients. Why is it so good… very economical, easily portable and robust, impacted by few if any of the factors that influence other physique assessment techniques reliability such as hydration status, acute food and fluid intake etc. What it demands though is highly skilled practitioners." Associate Professor Gary Slater
- "I use it to assess changes in an athlete's body composition in response to the training that they are completing or when there is a change in a factor that may affect their body composition, e.g. change in diet, travel to altitude, etc. The key point is that we may monitor regularly over time so that we have some on-going baseline data but mostly it's to be used when we expect a change." Dr Kagan Ducker

Chapter 1 - Physique Assessment In Youth Sports For Talent Identification And Development

Why do you measure body size and shape for talent identification and development?

- "There is application of physique assessment for talent identification in sports where specific traits may predispose an athlete to competitive success. This can extend beyond body composition to broader physique traits. For example, longer levers provide a biomechanical advantage to rowers." Associate Professor Gary Slater
- "We know that certain body sizes/shapes and compositions are beneficial for certain sports (e.g. weightlifters having a low crural and brachial index, long distance runners being lean), which can help us with talent identification and developing our athletes to excel in their sports. Assessing their size/shape and composition can help us to monitor changes that are occurring in their body that we may or may not have been trying to elicit (e.g. measuring changes in muscle size when an athlete is progressing through a resistance training program that we have written)." Dr Kagan Ducker

Chapter 2 - Anthropometry And Health For Sport

Does body composition influence health?

- "Population data suggests being overfat increases the risk of developing lifestyle related diseases. However, it's understanding the distribution of that fat which may be most important… subcutaneous vs visceral fat mass. In contrast, being under muscled may also have adverse effects. Within the older population this is known as sarcopenia (age related loss of lean mass) which is also associated with impaired ability to maintain activities of daily living and thus need for care or ability to live independently." Associate Professor Gary Slater
- "Yes. Numerous studies have reported that increased fat mass, particularly visceral and ectopic fat tissues, influence risk of developing obesity and related diseases. Low fat-free mass, including bone mineral content and muscle tissues, increases risk of frailty and osteoporosis for elder populations." Associate Professor Masaharu Kagawa

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How do you use growth charts and normative data sets?

- "As a brief comparison for growth, acknowledging individual variability in growth." Associate Professor Masaharu Kagawa
- "It is important to keep in mind that for individuals less than 20 years of age, normative data comes from growth charts and thus it is inappropriate to use normative adult data. Growth charts exist for several variables including weight for age, stature for age, BMI for age, head circumference for age charts." Associate Professor Gary Slater

What variables are you interested in for determining appropriate growth?

- "Body mass, length/height, sitting height for general growth and circumferences and skinfolds for better understanding muscle and adipose tissue accumulations." Associate Professor Masaharu Kagawa

How do you use physique assessment to understanding growth changes?

- "Regular assessments on body size allow us to plot an individuals' growth that we can compare with the norms. Both regular assessments of body size and somatotype of children allows us to depict timing of puberty, including timing of peak velocities for height, body mass, and leg length. Tracking information on both genders allows us to observe gender differences." Associate Professor Masaharu Kagawa

What variables are you interested in for determining malnourishment?

- "Height, body mass, upper-arm circumferences etc…." Associate Professor Masaharu Kagawa

What variables are you interested in for determining obesity and related health problems?

- "Body mass, length/height to determine overall body size, whereas skinfolds, waist circumference and waist-to-height ratio for fat accumulation and distribution patterns." Associate Professor Masaharu Kagawa

Chapter 3 - Optimising Physique For Sports Performance

How do you work with coaches to plan athlete assessment?

- "I usually work in conjunction with the coach to determine a schedule for when assessments take place." Dr Stephen Hollings
- "It's always dealt with as part of planning the yearly program with coaching and sport science staff. This gives us our regular data points that form the basis of our testing program and aligns us with when we expect to see changes in certain variables. The testing can be repeated for individuals who need to be monitored more closely due to issues with weight management or when we are intensively trying to make changes to their body composition." Dr Kagan Ducker
- "Physique assessment is usually scheduled during planning prior to the pre-season. At this point in time we will identify what physique assessment techniques we will use and when assessments will be scheduled. Assessments are usually scheduled according to the training cycle, which varies markedly depending on the sport. However, as a minimum, assessments would be undertaken at the start and end of the pre-season, plus end of season. Additional assessments will be scheduled for athletes I am working with to manipulate their body composition, or for those who experience an injury or other event likely to impact body composition." Associate Professor Gary Slater

What are your clinical considerations in assessment of nutrition status of athletes?

- "As a sports physiologist my part is knowing the training load that I am imparting and knowing what adaptations I am trying to stimulate. Then I can work with the sports dietitian so that they can ensure that the nutrition planning for the athlete is spot on." Dr Kagan Ducker

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Does where you store body fat provide insight into the type of diet you should follow?

- "Within the fitness industry a program has gained popularity for that very reason. It claims that distribution of body fat provides insight into perturbations in specific hormones such as cortisol and growth hormone. For example, the iliac crest skinfold offers insight into 'carbohydrate tolerance or management of blood glucose levels', while the abdominal skinfold is an indirect measure of cortisol levels and the ability to manage stress. Furthermore, this program claims that dietary adjustments and strategic supplementation can help to manipulate these hormones and with this, reductions in site specific body fat. While fat distribution is clearly impacted by an array of hormones, the impact of specific dietary adjustments to influence targeted fat deposits remains a hypothesis to be tested. Thus other factors such as training loads and associated specific sporting and body composition goals, underlying medical conditions, existing diet and other factors, including social issues like cost and convenience should take precedence when planning the dietary intake of clients." Associate Professor Gary Slater

Chapter 4 - Physique assessment for sports equipment design, fit and performance optimisation

How is physique assessment important for ergonomics in sports?

- "The importance of quantifying the individual Paralympic athletes' anthropometry to maximise the potential benefit of their assistive technology may be observed in the selection and fitting of the appropriate prosthesis (prosthetic limb) for running and cycling athletes." Associate Professor Justin Keogh

Part II. How To Use The Selected Method And Report The Data

What is the best method for assessing body composition?

- "That partly depends on what you have access to and what you want the information for. At the end of the day that will guide what your best method is. A combination of measurements is likely to be best." Dr Kagan Ducker
- "This really depends on what outcome measures you are after and resources available. For example, will changes in skinfold sum in conjunction with body mass changes provide sufficient insight into body composition change or do you require an absolute estimate of fat and fat free mass or their change over time. Furthermore, consideration must be given to the validity, reliability, availability, expertise required and cost effectiveness of available techniques, especially given the fact that most practitioners will be undertaking assessments on clients periodically over time." Associate Professor Gary Slater

Is there a gold standard method of assessing body composition?

- "The one true reference or gold standard method is cadaver analysis so it's not something I would encourage with your clients! However a combination of techniques in what we call a 4-compartment model is something we use for any study in which changes in body composition are a key outcome variable. In this instance we use a combination of techniques. The Bod Pod measures body density, while dual energy X-ray absorptiometry measure bone mineral content and deuterium dilution measures total body water. Measuring bone and water content, rather than estimating these variables (as occurs when Bod Pod is used in isolation), significantly enhances the validity and precision of measurement." Associate Professor Gary Slater
- "Ultimately if we have access to you as a cadaver that we can break you down into smaller and smaller components until we figure out what you're made of. In a practical sense it's likely to be a combination of several assessments to increase the number of compartments we're assessing e.g., dual energy X-ray absorptiometry and Bod Pod." Dr Kagan Ducker

Why do you assess body size, shape and composition for athletes?

"Physique assessment is generally undertaken to monitor the impact of training and/ or diet on body composition. The association between physique traits and competitive success varies markedly from sport to sport and our assessments should reflect this. Routine monitoring may be undertaken for sports in which physique traits are associated with competitive success, but clearly less regularly in those in which there is little or no association. " Associate Professor Gary Slater

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What are your key tips for body composition assessment for athletes?

- "Firstly, identify what outcome variables you are after. Understand the time and resources that are available, plus frequency of assessment required. It's equally important to understand the precision of your method as knowing this helps to infer what is a real change in composition versus noise in the test. Understanding what factors influence the reliability of your measure will help to establish testing protocols that can be implemented at each assessment period. Finally, never assume an athlete has had their body composition assessed before. As such, explain the procedures to be undertaken in advance and why the assessment is to be undertaken. Timely feedback on the assessment is also critical." Associate Professor Gary Slater
- "Know the accuracy of your methods and be sure that you know that what you're measuring is meaningful and represents a real change. Recognise the right time to present results. Be sure to remember that the results are confidential." Dr Kagan Ducker
- "Ensure that the athlete is in the same nutritional, hydration, and pre-exercise state before each assessment." Dr Stephen Hollings

As a health care practitioner, should I consider purchasing equipment to monitor the body composition of my clients? If so, what should I use?

- "This is a question I am often asked by practitioners. When considering such an investment, the practitioner really needs to understand the technique and its associated assumptions plus outputs, including which of those that have been validated.There is also a need to give consideration to equipment maintenance and servicing to ensure the results don't drift over time. For most practitioners, this is a time consuming and expensive process. There are also practical issues to address like cost implications. In general, this often means limiting in-house assessment to surface anthropometry. If an absolute estimate of body composition is required, a practitioner should explore partnering with a group that has expertise in body composition assessment. Entrusting the interpretation of the effectiveness of your interventions is not a decision that should be taken lightly so due diligence is encouraged. For example, machine specific precision error should be made available to you, plus detailed advice on client presentation that can be forwarded to clients in advance of assessment." Associate Professor Gary Slater
- "It always depends on your budget. If you only have money for anthropometric measures then stick with that equipment (suppliers on the ISAK website). If you have money for more expensive tools (e.g. bioelectrical impedance analysis, Bod Pod, dual energy X-ray absorptiometry) just be aware of what the limitations are of that equipment. Sometimes the expensive tools aren't as good as a qualified and experienced professional. More importantly you should consider the training that you need to use the techniques effectively." Dr Kagan Ducker

Chapter 5 - Athlete Considerations For Physique Measurement

Does what I do prior to a scan influence results?

- "Absolutely. We have recently completed a six month study which clearly illustrated that if client presentation is not standardised, you can get a completely different interpretation of changes on body composition. This was true for almost all techniques we tracked, including bioelectrical impedance analysis, Bod Pod, dual energy X-ray absorptiometry and various combinations of these. The exception was surface anthropometry, which seems to be a very robust measure. As such, we now provide detailed advice to clients well in advance of assessments that aims to ensure they present overnight fasted, bladder voided, in a rested, euhydrated and glycogen replete state while wearing suitable clothing." Associate Professor Gary Slater
- "Most certainly. Things like whether you've eaten, hydration status, prior exercise (especially swimming) may influence the results of the scan. It's important to standardise some factors." Dr Kagan Ducker

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Chapter 6 - Non-imaging method: Surface anthropometry

In the modern age of body scanning, does surface anthropometry still have a role to play?

- "Scanning techniques including dual energy X-ray absorptiometry, computed tomography and magnetic resonance imaging are becoming increasingly used in hospital and research settings compared to surface anthropometry. However, while these techniques provide detailed anthropometric and morphological characteristics of a variety of body tissues, they still have limitations based on ease of access, training required to perform the scans and cost. On this basis, I believe surface anthropometry still has an important role to play for many more years." Associate Professor Justin Keogh

Is surface anthropometry still worthwhile given all the new technology available?

- "Yes, certainly. The benefit of surface anthropometry is its portability and the fact that you can test athletes at their training or competition venues with minimal disruption to their normal routines." Mr Kelly Sheerin

Is surface anthropometry actually accurate?

- "As long as the measurer is appropriately trained, regularly measures, and follows the ISAK guidelines, accurate results can be obtained."

I measured myself on some scales and they told me I had 9% body fat. Will your results be able to compare to these?

- "Body fat percentage results are estimates that are calculated via one of a range of regression equations. There are a number of assumptions and limitations associated with the use of such equations. The foundation of these equations are neither valid nor reliable, the value of such variables is highly questionable. Sticking with the raw scores provided by surface anthropometry is a much better approach." Mr Kelly Sheerin

Chapter 7 – Non-Imaging Method: 3D Scanning

What is 3D scanning useful for?

- "Three-dimensional scanning is a reference method for measuring body volume and surface area. There is limited research validating its use to track changes in body composition to date. However the technique has been used in large scale observational studies to easily collect information on body circumference and length measures in a timely manner." Associate Professor Gary Slater
- "Probably not so much for body composition just yet, but it is quite useful for body shape and volume. Three-dimensional scanning is used a lot within textiles and ergonomics applications" Dr Kagan Ducker

Chapter 8 - Non-Imaging Method: Air Displacement Plethysmography (Bod Pod)

What is air displacement plethysmography or Bod Pod useful for?

- "This is the new age version of underwater weighing, providing a best practice measure of body volume and density based on displacement of air from an enclosed chamber. Unfortunately, the technique still relies on equations from 50s and 60s to convert to density into composition estimates, that fail to account for biological variability in the density of fat free mass components, resulting in errors of as much as 4%." Associate Professor Gary Slater
- "Considering the downsides of underwater weighing, it's a useful technique to assess body density and volume. It is now relatively common place, so access is good." Dr Kagan Ducker

Chapter 9 - Non-Imaging Method: Bioelectrical Impedance

What is bioelectrical impedance useful for?

- "This is a measure of resistance to flow. This impedance measure is then converted into composition estimates based on one of many regression equations. It is the most readily available technique commercially but also tends to be one impacted the most by client presentation, with estimates of fat and fat free mass both potentially increasing and decreasing depending on individual client nuances in their presentation." Associate Professor Gary Slater

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- "Bioelectrical impedance analysis devices are now relatively cheap and access is good. If standardised procedures are used it could add another method to estimate body composition from body water." Dr Kagan Ducker

Chapter 10 - Non-Imaging Method: Doubly Labelled Water

Why is the doubly-labelled water technique not commonly used for athletes?

- "The use of doubly-labelled water (commonly known as deuterium dilution) amongst athletic populations is uncommon due to the technical nature, cost and lack of availability of the assessment." Professor Elaine Rush

Chapter 11 - Imaging Method: Ultrasound

What is ultrasound useful for?

- "The ultrasound technique allows us to visualize subcutaneous adipose tissue for participants. Unlike skinfolds that measure a double fold of skin and subcutaneous adipose tissue, ultrasound provides a single layer of skin and the underlying subcutaneous adipose tissue, therefore it may be easier for athletes to understand the results." Associate Professor Masuhara Kagawa
- "Research on ultrasound is really starting to emerge again after initial interest in the 80s. The technique carries with it many of the strengths of surface anthropometry but without the same degree of technical issues. For me, it's a watch this space." Associate Professor Gary Slater
- "The ultrasound technique for physique assessment is new. It could be the new common, quick, accurate and relatively cheap method of assessment to replace skinfolds." Dr Kagan Ducker

Chapter 12 - Imaging Method: computed Tomography And Magnetic Resonance Imaging

What is magnetic resonance imaging useful for?

- "Magnetic resonance imaging is an excellent tool for visceral fat assessment, plus tracking relative change in a specific region of interest. While it does not provide is an absolute measure of fat or lean mass within a particular region, the cross sectional area information is invaluable." Associate Professor Gary Slater
- "I consider magnetic resonance imaging mostly a research tool for relatively accurate assessment of the body composition at particular sites/slices. It is good for seeing into any part of the tissues rather than being stuck closer to the surface or not having a good idea of the breakdown of the tissue in an area." Dr Kagan Ducker

Chapter 13 - Imaging Method: Dual-Energy X-Ray Absorptiometry

What is dual energy X-ray absorptiometry useful for?

- "Dual energy X-ray absorptiometry provides insight into a range of different variables, including whole body but also regional composition, invaluable when exploring issues of symmetry or regional composition changes such as tracking a client following injury. It has been validated to provide an index of visceral fat mass without the cost or high radiation exposure of magnetic resonance imaging and computed tomography respectively. It is also reference technique for assessment of bone health." Associate Professor Gary Slater
- "Dual energy X-ray absorptiometry allows us to get an idea about the body composition of the whole body and in different regions relatively quickly and accurately. It is a typical method for assessing bone health." Dr Kagan Ducker

How do you assess skeletal size, shape and bone mineral density?

- "Skeletal size and shape we would typically measure using anthropometry. Bone mineral density is typically measured using dual energy X-ray absorptiometry." Dr Kagan Ducker
- "Surface anthropometry derived length measures become particularly pertinent to assist in quantifying skeletal size. However when a measure of bone mineral density is sought, a dual energy X-ray absorptiometry scan would be required." Associate Professor Gary Slater

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How do you assess muscle tissue changes?

- "My test of choice to track changes in muscle mass is generally dual energy X-ray absorptiometry because it also provides insight into symmetry, something that is particularly pertinent following an injury when an athlete is vulnerable to disuse atrophy. However, if dual energy X-ray absorptiometry is not available, other measures like skinfold corrected girths may offer some insight into regional changes in muscle mass." Associate Professor Gary Slater
- "Dual energy X-ray absorptiometry is probably the easiest global measure to use. On a regular basis I tend to use anthropometry. The combination of body-mass, skinfolds and girths is quite handy." Dr Kagan Ducker

Chapter 14 - Imaging Method: Technological And Computing Innovations

What is new for imaging physique given technology developments?

- Three-dimensional body scanning systems integrated with other imaging modalities to create multi-faceted digital human profiles, and artificial intelligence techniques such as deep learning and artificial neural networks, are set to revolutionise the physique assessment landscape over the coming decade." Professor Jacqueline Alderson

Part III. Application Of Physique Assessment In Athletes

Chapter 15 - Physique Assessment In Practice

Do you have an example of when and how you measure physique of athletes?

- "See my YouTube Physique Assessment series of videos where I demonstrate measurements using dual energy X-ray absorptiometry, Bod Pod and surface anthropometry." Associate Professor Gary Slater
- "I commonly measure physique of athletes for talent identification. We know that some factors are important for success in a sport so we monitor those. I mostly use surface anthropometric techniques and dual energy X-ray absorptiometry." Dr Kagan Ducker

How often should body composition be assessed?

- "Depends on 2 things…1. Client and goal they are trying to achieve, and 2. Method of assessment and its reliability. Highly precise or reliable techniques allow more regular assessments. While I may skinfold an athlete I am working with to change body composition every three to four weeks, other techniques like DXA or BOD POD would not be implemented more frequently than every two to three months." Associate Professor Gary Slater
- "The main question is how often are you expecting to see a change? We do need to collect regularly so that we have a "normal" reference point and tracking over time, but mostly we want to know if things are changing when we know that factors may affect body composition (training, diet, external factors)." Dr Kagan Ducker

Why do you use multi-component models of body composition?

- "All 2-compartment models make assumptions. By combining results from various techniques you can omit assumptions. For example, the Bod Pod assumes a certain amount of bone and water within the far free mass. Rather than accepting this assumption, bone can be measured via dual energy X-ray absorptiometry while total body water can be measured using deuterium dilution. This multi-compartment model offers a more accurate measure of body composition but is resource heavy, including cost and time commitment required for assessment." Associate Professor Gary Slater
- "The more compartments that you can accurately assess, the better of an idea you can get about the breakdown of the composition of the body. Given that we're estimating body composition from these techniques it's important that we give ourselves the best chance of making an accurate assessment by maximising the compartments in our model." Dr Kagan Ducker

What variables are you interested in when tracking clients longitudinally?

- "Mainly skinfolds for the middle-distance athletes that I work with." Dr Stephen Hollings
- "Height, body mass, skinfolds, circumferences." Associate Professor Masaharu Kagawa

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- "Changes in body mass are quite noisy and offer little insight into body composition. As such, I'm most interested in tracking changes in absolute fat and fat free mass. While athletes get caught up in their body fat percentage, it's important to recognise this is a derived variable and as such, is impacted just as much by changes in fat free mass as it is fat mass. If absolute estimates of fat and fat free mass are not required, simply tracking changes in raw skinfold data in conjunction with body mass changes often provides me all the information I need." Associate Professor Gary Slater
- "Typically I will track the core variables such as height and body-mass, but in sports physiology we're most interested in tracking changes in body composition associated with athletic adaptations. So muscle and body fat. Therefore, skinfolds and girths are the core of my work." Dr Kagan Ducker

Can body composition variables be compared in cross-ethnic settings without problems?

- "Sometimes requires consideration of differences in body size." Associate Professor Masaharu Kagawa

Are there any issues with anthropometry measurement protocols and data for in Japan?

- "Yes, many different protocols exist and therefore we are unable to compare the reported values." Associate Professor Masaharu Kagawa
- "Lack of reliability in reported data." Associate Professor Masaharu Kagawa

What are the examples of different protocols available in Japan and how are they different to each other?

- "National School Health Survey, and Japan Anthropometric Reference Data. They use different definitions for measurement sites, subject position and equipment." Associate Professor Masaharu Kagawa

Chapter 16 - Recommendations For Conducting Research On Athletes

How do you report results back to clients

- "Written reports that present the raw and important data, but with explanations of what it all means. It's often best to include some information to give context to the data e.g. comparisons to norms and conversion to other variables that are more intuitive such as somatotypes and ratios." Dr Kagan Ducker

Chapter 17 - Physique Characteristics Associated With Athlete Performance

What types of physique characteristics are related to the expression of muscular strength?

- "The ability to accumulate large amounts of muscle mass in the primary agonist muscles per unit of height is perhaps the key anthropometric determinant of absolute muscular strength." Associate Professor Justin Keogh
- "Weightlifting, powerlifting and strongman athletes may be the strongest athletes in the world. Weightlifting and powerlifting, even at the highest level have body weight classes allowing lighter and heavier individuals to compete on an equal basis with athletes of their own body mass. The most successful athletes within their weight classes may be shorter in stature and possess short limbs then their less successful counterparts. Certain segment length proportions may also provide some advantage, with longer arms advantageous in the deadlift but disadvantageous in the bench press and overhead lifts." Associate Professor Justin Keogh

Chapter 18 - Body Image For Athletes

Does body composition assessment create unnecessary anxiety for clients?

- "Certainly body composition assessment has the potential to cause anxiety if not planned appropriately. Clients should be informed well in advance what to do the 24 hrs or so prior to scan, what to wear and what procedures will be undertaken. Dialogue should also be undertaken on the rationale for assessment and what outputs the athlete will obtain. During an assessment, the clients' safety and comfort should be your highest priority, with assessments undertaken accordingly, giving consideration to privacy issues. " Associate Professor Gary Slater
- "For sure, particularly in athletes where they are often essentially made to do the testing as part of their organisation's testing procedures. This often stems from negative feedback following the assessment, like when results are released to be seen by all members of a training group, or when they are part of selection procedures. These are some of the many reasons that these practices are discouraged." Dr Kagan Ducker

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Chapter 19 - Training And Accreditation Systems And Ethical Considerations

Why are standardized protocols and valid and reliable measures needed for assessment?

- "This ensures you minimise the noise inherently in all body composition assessment techniques so that you can more easily track the true changes in composition. That noise can be either technical or biological so there is a need for standardisation in what the technician does but also the client presentation. Ensuring a client presents rested and in a well hydrated state can really enhance the reliability of most assessment techniques. When protocols are implemented that recognise and control for the technical and biological error in valid techniques, we have an opportunity to identify small but potentially important changes in body composition. This can be especially important for athletic groups." Associate Professor Gary Slater
- "They are vital. If you don't standardise everything you will struggle to pick up a change from the "noise" of your measurement. With athletes we are often chasing small changes and we need to know that the measures that we have are real and meaningful in some way. Standardisation means that we can assess change over time accurately." Dr Kagan Ducker

Why is precision in body composition measurement techniques important?

- "Read the paper by Professor Patria Hume about how important it is to measure skinfolds at the correct site." Dr Stephen Hollings
- "If you have the best training and/or dietary intervention in the world, you won't know really how effective it is unless the measurement obtained by body composition methods can identify real change. If the 'noise' in the measurement is greater than the change in physique, then an opportunity is lost. This may result in a frustrated athlete or client who loses faith in your professional skills for obtaining successful changes in physique. The athlete won't blame the machine or its' findings, they'll blame you for not implementing a good training and/or diet regime." Ms Ava Kerr

Does it matter if I am assessed by different people on different equipment?

- "Absolutely. There is little value in having repeat measures taken if assessed by different technicians and/ or different equipment. Research shows that even the same model of equipment can give different results." Associate Professor Gary Slater
- "100% yes! For anthropometry definitely, that's the reason that ISAK exists, to standardise techniques. The difference between people and equipment can be vast. We know that there are differences between things like dual energy X-ray absorptiometry scanners, but if we take something like anthropometry, ISAK exists to standardise techniques and calibration methods to ensure a relatively known level of intra and inter-rater TEM." Dr Kagan Ducker

Where do I go to get my body composition assessed?

- "Accredited practicing dietitians or accredited exercise physiologists are professionals who often have expertise in the assessment of body composition. Check if your dietitian or physiologist has training through the International Society for the Advancement of Kinanthropometry. If you are interested in having a DXA, BOD POD or bioelectrical impedance assessment, your dietitian or physiologist may be best placed to advise you on a group who specialise in the use of these techniques to provide an accurate measure of body composition." Associate Professor Gary Slater
- "Your local sports physiologist or accredited practicing dietitian may be your best bets. Be sure to check that they are ISAK accredited so that you know that they meet a certain standard of reliability and training. Having said that, many health professionals including nutritionists, Exercise and Sports Science Australia (ESSA) accredited exercise scientists, accredited sports scientists and accredited exercise physiologists may hold an ISAK accreditation. Be sure to check." Dr Kagan Ducker

How do you gain consent to conduct measurements of athletes?

- "As with any technique, we must obtain consent prior to assessment, whether that be in writing as part of a research activity or verbally as part of day to day monitoring of clients. It is critical to explain what is going to occur using terminology clients understand." Associate Professor Gary Slater

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- "This depends on the situation in which they are collected. Many athletes sign off an agreement as part of training with a group or team. The consent process can be obtained there, otherwise an individual consent form should be signed off by the athletes in writing. Following the Australian health and medical research council guidelines that academics follow for research would be ideal." Dr Kagan Ducker

How do you maintain confidentiality when assessing body composition, especially in a team sport environment?

- "Confidentiality is a key concern. The primary way is to avoid posting group results as has been the common practice of many team environments. Typically team-sport athletes should have signed off something with their team to say that their testing results can be shared with club coaching, medical and sports science staff before any information is shared. The scientist (dietitian or sports scientist) should consider whether the information is pertinent right at that moment and then the results should be shared with the athlete, or potentially with the athlete and coaches/medical/sports science staff in the confidential team meeting." Dr Kagan Ducker

How do you store athlete information?

- "Hard copies are always in locked cabinets and electronic copies are always stored on password secured hard drives. The information is confidential." Dr Kagan Ducker

If I have concerns about body composition assessment, where do I go for information?

- "Professionals with training in body composition assessment include accredited practising dietitians and accredited exercise physiologists. The respective professional governing bodies of these health practitioners provide links to professionals in your region." Associate Professor Gary Slater
- "Your Dietitians Associate of Australia accredited practicing dietitian or ESSA accredited exercise scientist/sports scientist/exercise physiologist should be able to help you, or will know someone with the skills and experience who can." Dr Kagan Ducker

J.E. Lindsay Carter Kinanthropometry Clinic and Archive

The J.E. Lindsay Carter Kinanthropometry Clinic and Archive (JELCKCA) is available at jelckca-bodycomp.com. The JELCKCA provides a database of previous research in the field of kinanthropometry. Published papers and books, teaching material and other related resources are available to the international community in order to facilitate expansion of research around the globe. Physical resources are stored in the J.E. Lindsay Carter Kinanthropometry Clinic in New Zealand and can be searched electronically in the online archive. Most resources are available electronically for download via the website.

In scientific fields investigating humans, change over time is often an important factor, which can shed light on the findings for the current population. However, keeping track of historical data can be problematic. In the relatively new field of kinanthropometry, we are fortunate to have access to the research of some of the earliest experts in the field, and are now making them available internationally. It is envisioned that the archive will continue to grow as people continue to contribute their research and data. Data from studies of athletes, growth and development, special populations and different ethnic groups are collected in the database. Researchers will be able to study larger population groups from within the database, while individuals will be able to compare their anthropometric profile to a selected reference population.

Some content housed in the database are not available to individuals without an IASK level 2 or higher accreditation. If you have an ISAK level 2 or higher accreditation you need to register in order to unlock this content. From the main page, click on the JELCK archive search link found in the menu on the left of the page. You will be taken to the main search page where there is the option to login. Below the login box there are links to reset your password or to register. Click on the register link. Fill in the details requested. In the box labelled ISAK number please enter your level (i.e. 2 for ISAK level 2), and the year you received this accreditation. Once you click *save,* a message will be sent to the archive administrator who will then unlock the material specific to your level. You will need to login in order to search and view this material in future. The locked material is material relevant to the measurement, recording, assessment and teaching of ISAK specific content.

This is a post-peer-review, pre-copyedit version of a chapter published in
P. A. Hume, D. A. Kerr, & T. R. Ackland (Eds.), Best Practice Protocols for Physique Assessment in Sport.
The final authenticated version is available online at: https://doi.org/10.1007/978-981-10-5418-1_20

Summary

See jelckca-bodycomp.com and http://tinyurl.com/YouTubeChannel-ProfPatria for additional resources for *Best Practice Protocols For Physique Assessment In Sport.*

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